

As We See It

When we look back at the 1990s, from the perspective of say 2010, the nature of the forces currently in train will have presumably become clearer. We may conceivably conclude from that vantage point that, at the turn of the millennium, the American economy was experiencing a once-in-a-century acceleration in innovation, which propelled forward productivity, output, corporate profits, and stock prices at a pace not seen in generations, if ever.

—Alan Greenspan
January 2000

The above quote was utilized in a report written by Darren Williams and Richard Reid of Donaldson, Lufkin & Jenrette's London office. In their report they suggest we are in the early stages of a third industrial revolution as a result of the explosion in spending on information and communications technologies.

According to the authors, the first, or British Industrial Revolution started around 1760 and lasted until about 1840. The second, or American Industrial Revolution began in 1840 and ended in the early 1900s. The early 1970s witnessed the beginning of the third industrial revolution known as the Information Revolution.

Each of these revolutions experienced some similar characteristics. Of particular interest is that the early years of each industrial revolution were characterized by a slowdown in productivity. It appears that productivity growth slowed for the first 40 years of the British Industrial Revolution, while the American Industrial Revolution had a similar experience during its initial 20 years. The early years of the Information Revolution saw a repeat of this phenomenon. Annual U. S. productivity between 1974 and 1995 averaged just 1.2%, down from 3.2% for the previous 25 years.

The fact that each of these industrial revolutions took place on a variety of intertwining fronts was another common characteristic. The British Industrial Revolution took manufacturing out of the home and workshop. Power-driven machines replaced handwork, and factories developed as the best way of bringing together the machines and workers to operate them. While the British Industrial Revolution took place in a number of areas, the most important was probably the textile industry. For hundreds of years yarn had been created in the home on a simple device called the spinning wheel. With the industrial revolution, the industry went from the spinning of one thread of yarn at a time in the home to spinning many threads of yarn simultaneously on power-driven machines in a factory. A similar transformation took place in the weaving industry. All of this could not have happened without the invention of the steam engine, a key parallel innovation.

Williams and Reid identify communications (the telegraph and telephone), transportation (steamships and railways), and electricity as the areas in which the American Industrial Revolution took place. There were many complimentary innovations with electricity perhaps the most important.

The authors identify 1971 as the starting point for the Information Revolution as it is from that point, with the development of the first microprocessor, that the speed and complexity of the computer exploded. They identify the mouse and CD-ROM as complementary innovations but feel, “. . . the most important parallel innovation has been the Internet, which has linked the world's computers together, allowing them to unleash their true potential.” The Internet development could not have advanced without the improved technologies of optics, especially optic fiber, another complementary innovation.

Once the complementary innovations reached a critical mass, each of the past industrial revolutions experienced a prolonged period of above normal productivity and economic growth. Williams and Reid think the U. S. has reached that point and has entered a prolonged period of above normal productivity growth that could last for two decades or more, and that Europe will soon follow.

Of course, the outlook is not free of problems. The positive structural backdrop will not insulate the economy from normal cyclical ups and downs. And the prices of many stocks, especially those involved with directly producing information technology goods and services, already reflect a very bullish view of the future. Going forward, the challenge will be to identify those companies that are *using* information technology most effectively. Companies that are very successful in exploiting new technologies may well produce the best performance going forward.

July, 2000